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For: Dynamic Handling of Orphan Cells

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Dear Examiner:

Supplemental Response

This reply is in response to the Advisory Action of April 21, 2006 and the Final Office Action dated November 30, 2005.

Listing of claims begins on page 2 of this paper.

Remarks/Arguments begin on page 7 of this paper.

Listing of Claims:

1. (Canceled)

2 (Previously Presented) The method according to Claim 3, wherein said determining step comprises said base transceiver station determining that contact has been lost between said base transceiver station and said primary base station controller.

3. (Previously Presented) In a mobile telecommunications system that includes a plurality of base station controllers, a method for handling a base transceiver station that has become orphaned as a result of a loss of a primary base station controller that normally controls the base transceiver station, the method comprising:

determining that contact has been lost between said base transceiver station and said primary base station controller, wherein said base transceiver station includes a memory having a list identifying base station controllers by which said base transceiver station is willing to be controlled;

identifying a secondary base station controller from among said plurality of base station controllers to adopt said base transceiver station, said base transceiver station contacting base station controllers identified in said list one at a time until said secondary base station controller is identified; and

effecting a handover of said base transceiver station from said primary base station controller to said secondary base station controller.

4. (Original) The method according to Claim 3, wherein said list is a prioritized list, and wherein said base transceiver station contacts base station controllers identified in said list one at a time in order of priority.

5. (Original) The method according to Claim 4, wherein said primary base station controller is the base station controller identified in said prioritized list which is of highest priority.

6. (Original) The method according to Claim 3, and further including the step of said base transceiver station waiting a period of time after determining that contact has been lost between said base transceiver station and said primary base station controller before contacting base station controllers identified in said list.

7. (Original) The method according to Claim 6, wherein said step of waiting a period of time comprises waiting a first fixed period of time and thereafter waiting a second random period of time.

8. (Original) The method according to Claim 2, wherein said identifying step includes said base transceiver station sending a broadcast message to said plurality of base station controllers.

9. (Original) The method according to Claim 8, wherein said plurality of base station controllers comprises all base station controllers in a base station system of said mobile telecommunications system.

10. (Original) The method according to Claim 8, and further including the step of said base transceiver station waiting a period of time after determining that contact has been lost between said base transceiver station and said primary base station controller before sending said broadcast message.

11. (Original) The method according to Claim 10, wherein said period of time includes a first fixed period of time and up to a second random period of time.

12. (Original) The method according to Claim 11, and further including the step of said base transceiver station waiting up to a third period of time after sending said broadcast message for a response thereto, and repeating the step of sending a broadcast message if a response is not received within said third period of time.

13. (Original) The method according to Claim 2, wherein said identifying step includes said base transceiver station contacting a sub network manager of said mobile telecommunications system, and wherein said step of effecting a handover includes said sub network manager initiating said handover.

14. (Original) The method according to Claim 13, wherein said identifying step comprises said sub network manager contacting one or more of said plurality of base station controllers to identify said secondary base station controller.

15. (Original) The method according to Claim 13, wherein said identifying step comprises said sub network manager ordering one of said plurality of base station controllers to be said secondary base station controller.

16. (Previously Presented) The method according to Claim 3, wherein said determining step comprises a base station controller of said plurality of base station controllers determining that contact has been lost between said base transceiver station and said primary base station controller.

17. (Original) The method according to Claim 16, wherein each base station controller of said plurality of base station controllers sends a broadcast message to others of said plurality of base station controllers, and wherein each base station controller includes timers which time the broadcast messages sent from said others of said base station controllers, and wherein said determining step includes determining that contact has been lost between said base transceiver station and said primary base station controller when a timer associated with said primary base station controller expires without a message having been received from said primary base station controller.

18. (Original) The method according to Claim 17, wherein said others of said plurality of base station controllers comprise predetermined ones of said plurality of base station controllers.

19. (Previously Presented) The method according to Claim 3, wherein said mobile telecommunications system includes a sub network manager, and wherein said determining step comprises said sub network manager determining that contact has been lost between said base transceiver station and said primary base station controller.

20. (Original) The method according to Claim 19, wherein said identifying step comprises said sub network manager contacting one or more of said plurality of base station controllers to identify said secondary base station controller.

21. (Previously Presented) The method according to Claim 3, and further including the step of said primary base station controller readopting said base transceiver station when contact is able to be reestablished between said base transceiver station and said primary base station controller.

22. (Previously Presented) The method according to Claim 21, wherein said readopting step comprises said base transceiver station requesting readoption of said primary base station controller.

23. (Previously Presented) The method according to Claim 21, wherein said readoption step comprises said base transceiver station advising said secondary base station controller that it wishes to be readopted by said primary base station controller.

24 - 25. (Canceled)

26. (Previously Presented) A mobile telecommunications system comprising:

a base station system, said base station system including a plurality of base station controllers, each of which controls at least one base transceiver station wherein said at least one base transceiver station includes a memory for storing a list identifying base station controllers by which said base transceiver station is willing to be controlled;

a determiner that determines whether contact has been lost between a base transceiver station and a primary base station controller that normally controls said base transceiver station;

an identifier, coupled to said at least one base transceiver station for identifying a secondary base station controller from among said plurality of base station controllers to adopt said at least one base transceiver station, said at least one base transceiver station contacting said plurality of base station controllers, identified in said list, one at a time until said secondary base station controller is identified;

a pointer which points to an element in said list to identify a potential secondary base station controller; and

handover means for handing over said base transceiver station from said primary base station controller to said secondary base station controller.

27. (Previously Presented) The mobile telecommunications system according to Claim 26, wherein said determiner includes a transmitter in said primary base station controller for transmitting a broadcast message to others of said plurality of base station controllers, and wherein said others of said plurality of base station controllers include a receiver for receiving said broadcast message and a timer for determining that said broadcast message has not been received in a period of time.

28. (Previously Presented) The mobile telecommunications system according to Claim 26, wherein said base station system further includes a sub network manager, and wherein said determiner is in said sub network manager.

REMARKS/ARGUMENTS

The Examiner argues that the System reads on the Applicant's claimed orphaned BTS when the System determines that the first connected link has gone down then changes to the second connected link. As the Applicant has discussed and the Examiner has agreed to, Spear discloses a base station subsystem that includes at least two base station controllers (BSC) and a base transceiver station (BTS) with both BSCs connected live to the BTS (Co.l 3, 59-63). When a first link that includes the first BSC goes down, the system switches to the second link and thus the second BSC. The Applicant respectfully asserts that a BTS with one live link and one dead link is not an orphan.

The Applicant's present invention discloses a BTS connected to one BSC and when the connected BSC goes down, there is no BSC connected to the BTS (paragraph 0028). The BTS, checking a prioritized list of nearby BSCs, searches for an available BSC that is compatible with the BTS (paragraph 0029). If the BSC does not accept the attempted connection the orphaned BTS contacts the next BSC in the list (paragraph 0029). Spear does not disclose the memory in the BTS for storing the prioritized list of BSC controllers, nor does the Hess reference. Neither Spear nor Hess discloses an orphaned BTS checking a prioritized list for a new BSC and attempting connection with each one until a successful connection. Spear provides at least two live connections to the BTS, whereas the Applicant provides a prioritized list of compatible BSCs for the BTS to check until a BSC agrees to the connection.

Hess uses a list of BTS's stored in a mobile station for handover. If Spear is modified with Hess, there is still no orphaned BTS, no prioritized list of BSCs and no seeking of a compatible BSC. The BTS is looking for a controller in the prioritized list and the mobile station is looking for connection to the network in its list of base stations. The only common feature is that the BTS has a list and the mobile station has a list.

The Applicant respectfully submits that the Hendershot reference, in the rejection of claim 7, implies waiting a random period of time and the Applicant understands that this is the reason that Hendershot is cited. However, claim 7 states that the BTS waits

for a fixed period of time and then a random period of time. The fixed period is to confirm that the BTS has been orphaned and the random period of time is inserted after the fixed time wherein the BTS then broadcasts that the BTS has lost the controlling BSC (paragraph 0033).

In summary, the Applicant respectfully submits that Spear, Hess, Hendershot and Logsdon all lack the limitations of; 1) an orphaned BTS, utilizing 2) a prioritized list 3) stored in a memory at the BTS to 4) identify and acquire connection to another BSC.

Claim Rejections – 35 U.S.C. § 103 (a)

Claims 2-6 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear (US 006192037B1) in view of Hess, et al. (US 005471670A). The Applicant respectfully continues to traverse the rejection of these claims

The Spear reference is cited for reading on the limitations in claim 3. The Applicant respectfully directs the Examiner's attention to Claim 2

> 3. (Previously Presented) In a mobile telecommunications system that includes a plurality of base station controllers, a method for handling a base transceiver station that has become orphaned as a result of a loss of a primary base station controller that normally controls the base transceiver station, the method comprising:
>
> determining that contact has been lost between said base transceiver station and said primary base station controller, wherein said base transceiver station includes a memory having a list identifying base station controllers by which said base transceiver station is willing to be controlled;
>
> identifying a secondary base station controller from among said plurality of base station controllers to adopt said base transceiver station, said base transceiver station contacting base station controllers identified in said list one at a time until said secondary base station controller is identified; and
>
> effecting a handover of said base transceiver station from said primary base station controller to said secondary base station controller. (emphasis added)

The Applicant has reviewed the cited portions of Spear and respectfully disagrees with the comparison.

The Spear system determines whether a first link 110 is no longer the preferred link such as when the link has gone down (Col. 3, lines 25-31). The cited portion of Spear discloses a mobile station in communication with a particular base station subsystem. If the system determines that the first link between a BTS and a first BSC is down, the communication between the BTS and the mobile station is switched to a second, BSC already connected to the subject BTS. The communication link is being switched from a failed connection to a "live" connection at the second BSC. As noted in Spear, BTS 104 is connected to first BSC 106 and to second BSC 107 (Col. 2, lines 62-63). The problem that Spear is trying to solve is the problem of redundant controllers connected to a BTS when one of the BSC fails and calls being dropped due to the inability to connect to the MSC (Col. 1, line 66 to Col. 2, line 7)

It is respectfully submitted that the Spear system does not read on the subject limitations because the each of the Spear BTS's are connected to more than one BSC. The preamble in Applicant's claim 3 describes a BTS that has become "orphaned." In the Applicant's specification the term "orphaned" is described as one losing contact with a controlling BSC. No calls can be made in the cells that the orphaned BTS controls and even emergency calls cannot be made in those cells. The Applicant's orphaned BTS is very different from the BTS in Spears that has two or three BSC's already linked to the BTS for redundancy. If one of the BSC's in Spears goes down, the BTS in Spear is not orphaned as described in the Applicant's invention; the Spear BTS has a connected backup, possibly two (Col. 3, 59-63). Therefore, the BTS in Spear is not disconnected from a BSC as disclosed in the Applicant's invention.

As noted, the Spear reference fails to disclose the BTS having a list identifying BSC's. As claimed in claim 3, the orphaned BTS of the Applicant's invention contacts BSC's that are not connected to the BTS and are identified in a list of BSC's, maintained in the orphaned BTS, one at a time until a new BSC is identified.

The Hess reference is cited for maintaining a list of alternate communication resources. Hess appears to disclose a method for handing off a communication that is occurring on one "communication resource" to another "communication resource". "Communication resource" is defined in the background of the invention as "...typically

radio frequency channels that occupy predetermined bandwidths or time slots in predetermined time frames." (Col. 1, lines 54-58). The Hess reference discloses a communication unit (determined to be a mobile phone) maintaining a list of alternate communication resources (channels) according to their signal "usabilities". (Col 6, line 28-33). Essentially, the Hess reference discloses a handover method between radio channels by monitoring the signal usability of another channel and switching to the channel with the best "usability".

The list in the Hess reference is maintained in a mobile station and the list comprises a list of communication channels and the mobile phone switches between channels based on the QoS of the channel. This is different from the claims of the Applicant's invention. In the Applicant's invention a BTS maintains a prioritized list of BSCs that are predetermined to be acceptable to the BTS for connection and when the BSC that is controlling the BTS goes down, the BTS initiates a search of the stored list for connection to a BSC. In the Applicant's invention the list is comprised of prioritized BSCs that are compatible with the BTS and the BTS begins the search when the BTS is orphaned.

The Applicant respectfully asserts that the list of acceptable BSC's maintained in a fixed BTS in the Applicant's invention is not equivalent to a list of alternate communication channels maintained in a mobile station as disclosed in Hess. Also, the search of a prioritized list of BSC's, executed by an orphaned BTS for a BSC does not equate to Hess's mobile station searching its stored list for an alternate communications channel. What is unique to the Applicant's invention, and what is not suggested or taught in the references, individually or in combination, is maintaining a list of acceptable BSCs in each BTS and when the connection between a BSC and the BTS goes down, the BTS using the list to search for and make a connection to a new BSC.

Claim 26 is analogous to claim 3 and contains similar limitations. Therefore, Applicants respectfully submit that the combination of Spear and Hess does not teach or suggest the invention presently claimed in Claims 3 and 26, and as such, the Applicant respectfully requests the withdrawal of the rejection of claims 3 and 26 and depending claims 2 and 4-6.

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear in view of Hess as applied to claim 6 above, and further in view of Hendershot (US004817126). The Applicant respectfully traverses the rejection of this claim.

The Hendershot reference is cited for disclosing waiting a random amount of time before transmitting. The Hendershot reference discloses communication between a field unit and a base station and operation of field units on different channels available on the base station. The random amount of time applies to a field unit waiting to transmit to the base station, not transmission between a BTS and a prospective BSC. The Applicant respectfully requests the withdrawal of the rejection of this claim.

Claims 8-10, 13-15, 19 and 20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear in view of Hess as applied to claim 2 above, and further in view of Logsdon et al (US005890054A). The Applicant respectfully traverses the rejection of this claim.

Claims 8-10, 13-15, 19 and 20 all depend from claim 3 and contain the novel limitations of claim 3. Furthermore, the Logsdon reference discloses a mobile station that is not connected to a network multicasting a distress packet to mobile station in the area of the non-connected mobile station. If the packet is accepted by a mobile device the distress packet is then forwarded to the network. Logsdon discloses a random multicast by a non-connected mobile station in the hopes that a mobile station in the area will act as intermediary to connect to the network. This is not the same as a BTS sending a message to BSC's on a prioritized list stored in the BTS. The Applicant respectfully requests withdrawal of the rejection of this claim for at least the reason of lack of limitations as claimed in independent claim 3.

Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear, Hess and Logsdon et al as applied to claim 10 above, and further in view of Hendershot. The Applicant respectfully traverses the rejection of this claim.

The Hendershot and Logsdon references are discussed above and the Applicant respectfully submits that neither Hendershot nor Logsdon supply the missing limitations claimed by the Applicant in claims 3 and 26 and both references apply to channel selection between mobile station and Base Station, not communications between BTS and BSC's that may be selected to replace an offline BSC. The Applicant respectfully requests the withdrawal of the rejection of claims 11 and 12.

Claims 16, 17, 18, 27 and 28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear in view of Hess as applied to claim 3 above, and further in view of Nakamura et al (US005822361A). The Applicant respectfully traverses the rejection of this claim.

The Nakamura reference appears to disclose a method of determining a master base station in a LAN. The master transmits a particular frame and when the frame is not received by the base stations in the LAN, contact is lost. However, the other base stations then try to determine whether or not they can be the master station. This is communication between base stations, not between a BTS and a BSC. Regardless, Nakamura does fail to disclose the limitations of Applicant's independent claims 3 and 26 from which claims 16-18 and 27-28 depend from respectively. The Applicant respectfully requests the withdrawal of the rejection of claims 16-18 and 27-28

Claim 21 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Spear in view of Hess et al as applied to claim 3 above, and further in view of Naqvi (US006625460 The Applicant respectfully traverses the rejection of this claim.

The Naqvi reference appears to disclose "a unified messaging protocol that enhances the currently available messaging capabilities of SMS." (Summary) The Applicant is unable to make the connection between the rejection and content of the Naqvi reference. Nevertheless, Naqvi does not supply the missing limitations of independent claim 3. The Applicant respectfully requests the withdrawal of the rejection of claim 21.

Claims 22 and 23 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Spear, Hess and Naqvi et al as applied to claim 21 above, and further in view of Logsdon et al. The Applicant respectfully traverses the rejection of these claims.

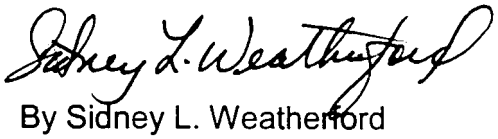
The cited references all fail to disclose the limitations in independent claim 3, as noted above, from which claims 22 and 23 depend. The Applicant respectfully requests the withdrawal of the rejection of these claims.

CONCLUSION

In view of the foregoing remarks, the Applicant believes all of the claims currently pending in the Application to be in a condition for allowance. The Applicant, therefore, respectfully requests that the Examiner withdraw all rejections and issue a Notice of Allowance for all pending claims.

The Applicant requests a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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